SEQUENCE LISTING

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<120> COMPOSITIONS AND METHODS FOR TREATING OR
      PREVENTING PNEUMOCOCCAL INFECTION

<130> 12844-002001

<140> US 10/702,305
<141> 2003-11-06

<150> US 60/424,497
<151> 2002-11-07

<160> 26

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 471
<212> PRT
<213> Streptococcus pneumoniae

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Ile Lys Glu Gly Asn Gln Leu Pro Asp Glu Phe Val Val Ile Glu Arg
        35   40   45
Lys Lys Arg Ser Leu Ser Thr Asn Thr Ser Asp Ile Ser Val Thr Ala
    50   55   60
Thr Asn Asp Ser Arg Leu Tyr Pro Gly Ala Leu Leu Val Val Asp Glu
65   70   75   80
Thr Leu Leu Glu Asn Asn Pro Thr Leu Leu Ala Val Asp Arg Ala Pro
                85   90   95
Met Thr Tyr Ser Ile Asp Leu Pro Gly Leu Ala Ser Ser Asp Ser Phe
            100   105   110
Leu Gln Val Glu Asp Pro Ser Asn Ser Ser Val Arg Gly Ala Val Asn
            115   120   125
Asp Leu Leu Ala Lys Trp His Gln Asp Tyr Gly Gln Val Asn Asn Val
    130   135   140
Pro Ala Arg Met Gln Tyr Glu Lys Ile Thr Ala His Ser Met Glu Gln
145   150   155   160
Leu Lys Val Lys Phe Gly Ser Asp Phe Glu Lys Thr Gly Asn Ser Leu
                165   170   175
Asp Ile Asp Phe Asn Ser Val His Ser Gly Glu Lys Gln Ile Gln Ile
            180   185   190
Val Asn Phe Lys Gln Ile Tyr Tyr Thr Val Ser Val Asp Ala Val Lys
        195   200   205
Asn Pro Gly Asp Val Phe Gln Asp Thr Val Thr Val Glu Asp Leu Lys
    210   215   220

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Gln Arg Gly Ile Ser Ala Glu Arg Pro Leu Val Tyr Ile Ser Ser Val
225             230             235             240
Ala Tyr Gly Arg Gln Val Tyr Leu Lys Leu Glu Thr Thr Ser Lys Ser
            245             250             255
Asp Glu Val Glu Ala Ala Phe Glu Ala Leu Ile Lys Gly Val Lys Val
            260             265             270
Ala Pro Gln Thr Glu Trp Lys Gln Ile Leu Asp Asn Thr Glu Val Lys
        275             280             285
Ala Val Ile Leu Gly Gly Asp Pro Ser Ser Gly Ala Arg Val Val Thr
    290             295             300
Gly Lys Val Asp Met Val Glu Asp Leu Ile Gln Glu Gly Ser Arg Phe
305             310             315             320
Thr Ala Asp His Pro Gly Leu Pro Ile Ser Tyr Thr Thr Ser Phe Leu
            325             330             335
Arg Asp Asn Val Val Ala Thr Phe Gln Asn Ser Thr Asp Tyr Val Glu
            340             345             350
Thr Lys Val Thr Ala Tyr Arg Asn Gly Asp Leu Leu Leu Asp His Ser
        355             360             365
Gly Ala Tyr Val Ala Gln Tyr Tyr Ile Thr Trp Asn Glu Leu Ser Tyr
    370             375             380
Asp His Gln Gly Lys Glu Val Leu Thr Pro Lys Ala Trp Asp Arg Asn
385             390             395             400
Gly Gln Asp Leu Thr Ala His Phe Thr Thr Ser Ile Pro Leu Lys Gly
            405             410             415
Asn Val Arg Asn Leu Ser Val Lys Ile Arg Glu Cys Thr Gly Leu Ala
            420             425             430
Trp Glu Trp Trp Arg Thr Val Tyr Glu Lys Thr Asp Leu Pro Leu Val
        435             440             445
Arg Lys Arg Thr Ile Ser Ile Trp Gly Thr Thr Leu Tyr Pro Gln Val
        450             455             460
Glu Asp Lys Val Glu Asn Asp
465             470
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<210> 2
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 2
gactagatct ccatatggca aataaagcag taaatgac                               38


<210> 3
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 3
cagtggatcc ttactagtca ttttctacct tatc                                   34


<210> 4
<211> 38
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<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 4
gactgctagc caccatggca aataaagcag taaatgac                    38

<210> 5
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 5
gactggatcc ttactagaga gttgttcccc aaatag                      36

<210> 6
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 6
gactggatcc ttactaatct tctacctgag gatag                       35

<210> 7
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 7
gactggatcc ttactattct accttatctt ctacctgag                   39

<210> 8
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 8
gactggatcc ttactaattt tctaccttat cttctacctg ag               42

<210> 9
<211> 1413
<212> DNA
<213> Artificial Sequence
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<220>
<223> synthetically generated construct

<400> 9

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atggcaaata aagcagtaaa tgactttata ctagctatga attacgataa aaagaaactc      60
ttgacccatc agggagaaag tattgaaaat cgtttcatca agagggtaa  tcagctaccc     120
gatgagtttg ttgttatcga aagaaagaag cggagcttgt cgacaaatac aagtgatatt     180
tctgtaacag ctaccaacga cagtcgcctc tatcctggag cacttctcgt agtggatgag     240
accttgttag agaataatcc cactcttctt gcggtcgatc gtgctccgat gacttatagt     300
attgatttgc ctggtttggc aagtagcgat agctttctcc aagtggaaga ccccagcaat     360
tcaagtgttc gcggagcggt aaacgatttg ttggctaagt ggcatcaaga ttatggtcag     420
gtcaataatg tcccagctag aatgcagtat gaaaaaatca cggctcacag catggaacaa     480
ctcaaggtca agtttggttc tgactttgaa aagacaggga attctcttga tattgatttt     540
aactctgtcc attcaggcga aaagcagatt cagattgtta attttaagca gatttattat     600
acagtcagcg tagatgctgt taaaaatcca ggagatgtgt ttcaagatac tgtaacggta     660
gaggatttaa aacagagagg aatttctgca gagcgtcctt tggtctatat ttcgagtgtt     720
gcttatgggc gccaagtcta tctcaagttg gaaaccacga gtaagagtga tgaagtagag     780
gctgcttttg aagctttgat aaaaggagtc aaggtagctc ctcagacaga gtggaaacag     840
attttggaca atacagaagt gaaggcggtt attttagggg gcgacccaag ttcgggtgcc     900
cgagttgtaa caggcaaggt ggatatggta gaggacttga ttcaagaagg cagtcgcttt     960
acagcagatc atccaggctt gccgatttcc tatacaactt ctttttacg tgacaatgta    1020
gttgcgacct ttcaaaatag tacagactat gttgagacta aggttacagc ttacagaaac    1080
ggagatttac tgctggatca tagtggtgcc tatgttgccc aatattatat tacttggaat    1140
gaattatcct atgatcatca aggtaaggaa gtcttgactc ctaaggcttg ggacagaaat    1200
gggcaggatt taacggctca ctttaccact agtattcctt aaaagggaa  tgttcgtaat    1260
ctctctgtca aaattagaga gcgttccggg cttgcctggg aatggtggcg tacggtttat    1320
gaaaaaaccg atttgccact agtgcgtaag cggacgattt ctatttgggg aacaactctc    1380
tatcctcagg tagaagataa ggtagaaaat gac                                 1413
```

<210> 10
<211> 1380
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetically generated construct

<400> 10

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atggcaaata aagcagtaaa tgactttata ctagctatga attacgataa aaagaaactc      60
ttgacccatc agggagaaag tattgaaaat cgtttcatca agagggtaa  tcagctaccc     120
gatgagtttg ttgttatcga aagaaagaag cggagcttgt cgacaaatac aagtgatatt     180
tctgtaacag ctaccaacga cagtcgcctc tatcctggag cacttctcgt agtggatgag     240
accttgttag agaataatcc cactcttctt gcggtcgatc gtgctccgat gacttatagt     300
attgatttgc ctggtttggc aagtagcgat agctttctcc aagtggaaga ccccagcaat     360
tcaagtgttc gcggagcggt aaacgatttg ttggctaagt ggcatcaaga ttatggtcag     420
gtcaataatg tcccagctag aatgcagtat gaaaaaatca cggctcacag catggaacaa     480
ctcaaggtca agtttggttc tgactttgaa aagacaggga attctcttga tattgatttt     540
aactctgtcc attcaggcga aaagcagatt cagattgtta attttaagca gatttattat     600
acagtcagcg tagatgctgt taaaaatcca ggagatgtgt ttcaagatac tgtaacggta     660
gaggatttaa aacagagagg aatttctgca gagcgtcctt tggtctatat ttcgagtgtt     720
gcttatgggc gccaagtcta tctcaagttg gaaaccacga gtaagagtga tgaagtagag     780
gctgcttttg aagctttgat aaaaggagtc aaggtagctc ctcagacaga gtggaaacag     840
attttggaca atacagaagt gaaggcggtt attttagggg gcgacccaag ttcgggtgcc     900
cgagttgtaa caggcaaggt ggatatggta gaggacttga ttcaagaagg cagtcgcttt     960
acagcagatc atccaggctt gccgatttcc tatacaactt ctttttacg tgacaatgta    1020
gttgcgacct ttcaaaatag tacagactat gttgagacta aggttacagc ttacagaaac    1080
```

```
ggagatttac tgctggatca tagtggtgcc tatgttgccc aatattatat tacttggaat      1140
gaattatcct atgatcatca aggtaaggaa gtcttgactc ctaaggcttg ggacagaaat      1200
gggcaggatt taacggctca ctttaccact agtattcctt taaaagggaa tgttcgtaat      1260
ctctctgtca aaattagaga gcgttccggg cttgcctggg aatggtggcg tacggtttat      1320
gaaaaaaccg atttgccact agtgcgtaag cggacgattt ctatttgggg aacaactctc      1380
```

<210> 11
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 11
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gactaagctt gccaccatgg aaattaatgt gagtaaatta ag                          42
```

<210> 12
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 12
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ctgactcgag ttattttact gtaatcaagc catc                                   34
```

<210> 13
<211> 954
<212> DNA
<213> Artificial Sequence

<220>
<223> pSA-59 Aly insert

<400> 13
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atggaaatta atgtgagtaa attaagaaca gatttgcctc aagttggcgt gcaaccatat        60
aggcaagtac acgcacactc aactgggaat ccgcattcaa ccgtacagaa tgaagcggat       120
tatcattggc ggaaagaccc agaattaggt ttttctcgc acattgttgg gaacggatgc       180
atcatgcagg taggacctgt taataatggt gcctgggacg ttgggggcgg ttggaatgct       240
gagacctatg cagcggttga actgattgaa agccattcaa ctaaagaaga gttcatgacg       300
gactaccgcc tttatatcga actcttacgc aatctagcag atgaagcagg tttgccgaaa       360
acgcttgata cagggagttt agctggaatt aaaacgcacg agtattgcac gaataaccaa       420
ccaaacaacc actcagacca tgtggatcca tacccttact tggcaaaatg gggcattagc       480
cgtgagcagt ttaagcatga tattgagaac ggcttgacga ttgaaacagg ctggcagaag       540
aatgacactg ctactggta cgtacattca gacggctctt atccaaaaga caagtttgag       600
aaaatcaatg gcacttggta ctactttgac agttcaggct atatgcttgc agaccgctgg       660
aggaagcaca cagacggcaa ttggtactac tttgaccaat caggcgaaat ggctacaggc       720
tggaagaaaa tcgctgagaa gtggtactat ttcaacgaag aaggtgccat gaagacaggc       780
tgggtcaagt acaaggacac ttggtactac ttagacgcta agaaggcgc aatggtatca       840
aatgcctttta tccagtcagc ggacggaaca ggctggtact acctcaaacc agacggaaca      900
ctggcagaca agccagaatt cacagtagag ccagatggct tgattacagt aaaa             954
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<210> 14
<211> 318
<212> PRT

<213> Artificial Sequence

<220>
<223> polypeptide of pSA-59 Aly insert sequence

<400> 14

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Met Glu Ile Asn Val Ser Lys Leu Arg Thr Asp Leu Pro Gln Val Gly
 1               5                  10                  15
Val Gln Pro Tyr Arg Gln Val His Ala His Ser Thr Gly Asn Pro His
            20                  25                  30
Ser Thr Val Gln Asn Glu Ala Asp Tyr His Trp Arg Lys Asp Pro Glu
            35                  40                  45
Leu Gly Phe Phe Ser His Ile Val Gly Asn Gly Cys Ile Met Gln Val
        50                  55                  60
Gly Pro Val Asn Asn Gly Ala Trp Asp Val Gly Gly Gly Trp Asn Ala
65                  70                  75                  80
Glu Thr Tyr Ala Ala Val Glu Leu Ile Glu Ser His Ser Thr Lys Glu
                85                  90                  95
Glu Phe Met Thr Asp Tyr Arg Leu Tyr Ile Glu Leu Leu Arg Asn Leu
            100                 105                 110
Ala Asp Glu Ala Gly Leu Pro Lys Thr Leu Asp Thr Gly Ser Leu Ala
            115                 120                 125
Gly Ile Lys Thr His Glu Tyr Cys Thr Asn Asn Gln Pro Asn Asn His
        130                 135                 140
Ser Asp His Val Asp Pro Tyr Pro Tyr Leu Ala Lys Trp Gly Ile Ser
145                 150                 155                 160
Arg Glu Gln Phe Lys His Asp Ile Glu Asn Gly Leu Thr Ile Glu Thr
                165                 170                 175
Gly Trp Gln Lys Asn Asp Thr Gly Tyr Trp Tyr Val His Ser Asp Gly
            180                 185                 190
Ser Tyr Pro Lys Asp Lys Phe Glu Lys Ile Asn Gly Thr Trp Tyr Tyr
            195                 200                 205
Phe Asp Ser Ser Gly Tyr Met Leu Ala Asp Arg Trp Arg Lys His Thr
        210                 215                 220
Asp Gly Asn Trp Tyr Tyr Phe Asp Gln Ser Gly Glu Met Ala Thr Gly
225                 230                 235                 240
Trp Lys Lys Ile Ala Glu Lys Trp Tyr Tyr Phe Asn Glu Glu Gly Ala
            245                 250                 255
Met Lys Thr Gly Trp Val Lys Tyr Lys Asp Thr Trp Tyr Tyr Leu Asp
            260                 265                 270
Ala Lys Glu Gly Ala Met Val Ser Asn Ala Phe Ile Gln Ser Ala Asp
        275                 280                 ' 285
Gly Thr Gly Trp Tyr Tyr Leu Lys Pro Asp Gly Thr Leu Ala Asp Lys
        290                 295                 300
Pro Glu Phe Thr Val Glu Pro Asp Gly Leu Ile Thr Val Lys
305                 310                 315
```

<210> 15
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 15
gactaagctt gccaccatgg aagaagctcc cgtagctagt cag   43

```
<210> 16
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 16
gactctcgag ctatccatca gggcctaact cattaag                              37


<210> 17
<211> 1377
<212> DNA
<213> Artificial Sequence

<220>
<223> pSA-60 PspA insert

<400> 17
atggaagaag ctcccgtagc tagtcagtct aaagctgaga aagactatga tgcagcagtg      60
aaaaaatctg aagctgctaa gaaggcttac gaagaagcta aaagaaagc agaagacgct      120
cagaaaaaat atgatgagga tcagaagaaa actgaggcaa aagcggataa ggaagcaaaa      180
gcatctgcgg aaatagataa agccacgttt gctgtacaaa gtgcgtatgt aaaattttta      240
aatgtccaat ctaatcgtca aatttcggag aatgaacgaa aaaacaatt agcagaaata      300
gataaagaga tagagaatgc taaacaaaat ttacagaata aacaggaaga atttaataag      360
gttagagcag aagtaattcc tgaagcaaag gggttagctg ttactaaaca aaaagcggaa      420
gaagctaaaa agaagcaga agtagctaag agaaaatatg attatgcaac tctaaaggta      480
gcactagcga agaaagaagt agaggctaag gaacttgaaa ttgaaaaact tcaatatgaa      540
atttctactt tggaacaaga agttgctatt gctcaacatc aagtagataa tttgaaaaaa      600
cttcttgctg gtgcggatcc tgatgatggc acaaaagtta tagaagctaa attaaacaaa      660
ggagaagctg agctaaacgc taaacaagct gagttagcaa aaaaacaaac agaacttgaa      720
aaacttcttg acagccttga tcctgaaggt aagactcagg atgaattaga taaagaagct      780
gctgaagctg agttggataa aaaagctgat gaacttcaaa ataaagttgc tgatttagaa      840
aaaggaattg ctccttatca aatcaaagtc gctgaattaa ataaagaaat tgctagactt      900
caaagcgatt taaaagatgc tgaagaaaat aatgtagaag actatattaa agaaggttta      960
gagcaagcta tcgctgataa aaaagctgaa ttagctacaa ctcaacaaaa catagataaa      1020
actcaaaaag atttagagga tgctgaatta gaacttgaaa agtattagc tacattagac      1080
cctgaaggta aaactcaaga tgaattagat aaagaagctg cagaagatgc taatattgaa      1140
gctcttcaaa acaaagttgc tgatctagaa aacaaggttg ctgaattaga taaagaagtt      1200
actagacttc aaagcgattt aaaagatgct gaagaaaca atgtagaaga ctacgttaaa      1260
gaaggcttag ataaagctct tactgataaa aaagttgaat taaataatac tcaaaaagca      1320
ttagatactg ctcaaaaagc attagatact gctcttaatg agttaggccc tgatgga       1377


<210> 18
<211> 459
<212> PRT
<213> Artificial Sequence

<220>
<223> polypeptide of pSA-60 PspA insert sequence

<400> 18
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 1               5                  10                  15
Asp Ala Ala Val Lys Lys Ser Glu Ala Ala Lys Lys Ala Tyr Glu Glu
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                  20                      25                      30
Ala Lys Lys Lys Ala Glu Asp Ala Gln Lys Lys Tyr Asp Glu Asp Gln
        35                      40                      45
Lys Lys Thr Glu Ala Lys Ala Asp Lys Glu Ala Lys Ala Ser Ala Glu
        50                      55                      60
Ile Asp Lys Ala Thr Phe Ala Val Gln Ser Ala Tyr Val Lys Phe Leu
65                      70                      75                      80
Asn Val Gln Ser Asn Arg Gln Ile Ser Glu Asn Glu Arg Lys Lys Gln
                85                      90                      95
Leu Ala Glu Ile Asp Lys Glu Ile Glu Asn Ala Lys Gln Asn Leu Gln
                100                     105                     110
Asn Lys Gln Glu Glu Phe Asn Lys Val Arg Ala Glu Val Ile Pro Glu
                115                     120                     125
Ala Lys Gly Leu Ala Val Thr Lys Gln Lys Ala Glu Glu Ala Lys Lys
                130                     135                     140
Glu Ala Glu Val Ala Lys Arg Lys Tyr Asp Tyr Ala Thr Leu Lys Val
145                     150                     155                     160
Ala Leu Ala Lys Lys Glu Val Glu Ala Lys Glu Leu Glu Ile Glu Lys
                165                     170                     175
Leu Gln Tyr Glu Ile Ser Thr Leu Glu Gln Glu Val Ala Ile Ala Gln
                180                     185                     190
His Gln Val Asp Asn Leu Lys Lys Leu Leu Ala Gly Ala Asp Pro Asp
                195                     200                     205
Asp Gly Thr Lys Val Ile Glu Ala Lys Leu Asn Lys Gly Glu Ala Glu
        210                     215                     220
Leu Asn Ala Lys Gln Ala Glu Leu Ala Lys Lys Gln Thr Glu Leu Glu
225                     230                     235                     240
Lys Leu Leu Asp Ser Leu Asp Pro Glu Gly Lys Thr Gln Asp Glu Leu
                245                     250                     255
Asp Lys Glu Ala Ala Glu Ala Glu Leu Asp Lys Lys Ala Asp Glu Leu
                260                     265                     270
Gln Asn Lys Val Ala Asp Leu Glu Lys Gly Ile Ala Pro Tyr Gln Ile
                275                     280                     285
Lys Val Ala Glu Leu Asn Lys Glu Ile Ala Arg Leu Gln Ser Asp Leu
        290                     295                     300
Lys Asp Ala Glu Glu Asn Asn Val Glu Asp Tyr Ile Lys Glu Gly Leu
305                     310                     315                     320
Glu Gln Ala Ile Ala Asp Lys Lys Ala Glu Leu Ala Thr Thr Gln Gln
                325                     330                     335
Asn Ile Asp Lys Thr Gln Lys Asp Leu Glu Asp Ala Glu Leu Glu Leu
        340                     345                     350
Glu Lys Val Leu Ala Thr Leu Asp Pro Glu Gly Lys Thr Gln Asp Glu
        355                     360                     365
Leu Asp Lys Glu Ala Ala Glu Asp Ala Asn Ile Glu Ala Leu Gln Asn
        370                     375                     380
Lys Val Ala Asp Leu Glu Asn Lys Val Ala Glu Leu Asp Lys Glu Val
385                     390                     395                     400
Thr Arg Leu Gln Ser Asp Leu Lys Asp Ala Glu Glu Asn Asn Val Glu
                405                     410                     415
Asp Tyr Val Lys Glu Gly Leu Asp Lys Ala Leu Thr Asp Lys Lys Val
        420                     425                     430
Glu Leu Asn Asn Thr Gln Lys Ala Leu Asp Thr Ala Gln Lys Ala Leu
        435                     440                     445
Asp Thr Ala Leu Asn Glu Leu Gly Pro Asp Gly
        450                     455
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<210> 19

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<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 19
ctgaggatcc ttactaagct gtaaccttag tctc                                    34

<210> 20
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 20
caaaattaga gaacgttccg ggcttgcctg ggaatgg                                 37

<210> 21
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 21
gcccggaacg ttctctaatt ttgacagaga gattacg                                 37

<210> 22
<211> 5
<212> PRT
<213> Streptococcus pneumoniae

<400> 22
Lys Val Glu Asn Asp
 1               5

<210> 23
<211> 7
<212> PRT
<213> Streptococcus pneumoniae

<400> 23
Glu Asp Lys Val Glu Asn Asp
 1               5

<210> 24
<211> 11
<212> PRT
<213> Streptococcus pneumoniae

<400> 24
Tyr Pro Gln Val Glu Asp Lys Val Glu Asn Asp
```

```
<210> 25
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 25
ctgaggatcc ttactatacc tgaggataga gagttgttc                        39

<210> 26
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 26
gactggatcc ctatacctga ggatagagag ttg                             33
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